



BENCHMARKS

The University of North Texas Computing Center Newsletter

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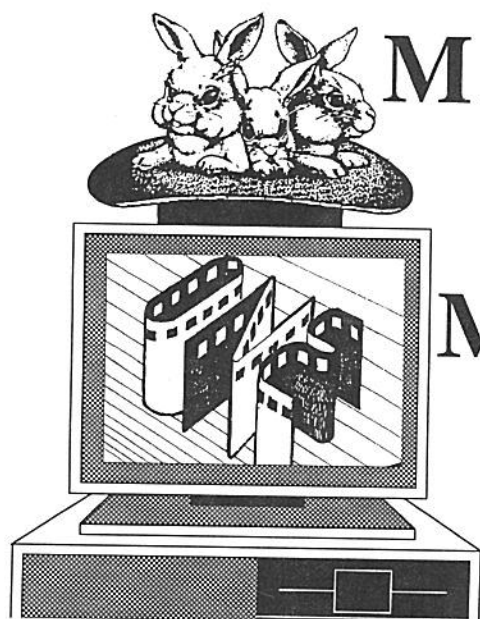
October 1992

The Focus of This Issue

By Claudia Lynch, Benchmarks Editor (as04@unt.edu)

As you can see, the focus of this issue is multimedia. Multimedia is the result of combining text, sound, graphics, animation, still images, and video for computer-generated presentations. As I stated in the March/April 1992 issue of *Benchmarks* (Vol. 13, No. 3, pp. 1,3) "It is being heralded as the next revolution in computing, supplanting the GUI (see the February 1992 issue of *Benchmarks*) as the most popular human-computer interface at the microcomputer level."

Back in the March/April 1992 issue of *Benchmarks*, we focused on instructional technology, with a heavy emphasis on multimedia. In this issue, we are looking at aspects of multimedia that we have not emphasized before. For example, the article on page 3 by Eriq Neale discusses MIDI and how it can play (pun intended) an important part in a multimedia workstation. If you are a Macintosh user, don't miss the "Quicktime" article by Sean McMains on page 5. The article on page 9 by Mark Thacker, "MIME: Multimedia Across the Internet" explores another exciting aspect of that technology — multimedia electronic mail. If you are interested in Audio-conferencing and video conferencing, don't miss this month's *Network Connection*, on page 10. Finally, the article on page 14 by George Mitchell, from the UNT Libraries, outlines a proposal for campus-wide multimedia delivery that has been submitted to the Provost. ■



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HOURS FOR UNIVERSITY OF NORTH TEXAS COMPUTER ACCESS AREAS : Fall 1992

Day of Week	Willis	BA	ISB 110	Chilton, Matthews, Music	GAB	Terrill, Wooten	ISB 205C	Lab Locations
Monday - Thursday	Open 24 hrs.	8 a.m. - 11:45 p.m.	7:30 a.m. - Midnight	8 a.m. - 10 p.m.	8 a.m. - Midnight	8 a.m. - 8 p.m.	Noon - 10 p.m.	☛ BA: 330, 332 ☛ Chilton: 255, 116 [Adaptive Lab] ☛ GAB: 330, 550 ☛ ISB: 110, 205C — grad. students only ☛ Matthews: 309 ☛ Music: 1007 ☛ Terrill 247 ☛ Willis: 134 ☛ Wooten: 120
Friday	Open 24 hrs.	8 a.m. - 8 p.m.	7:30 a.m. - 9 p.m.	8 a.m. - 5 p.m.	8 a.m. - 5 p.m.	8 a.m. - 5 p.m.	1 p.m. - 5 p.m.	
Saturday	Open 24 hrs.	8 a.m. - 8 p.m.	9 a.m. - 9 p.m.	10 a.m. - 5 p.m.	2-8 p.m.	Closed	10 a.m. - 5 p.m.	
Sunday	Open 24 hrs.	Noon - 11:45 p.m.	1 p.m. - Midnight	1 - 10 p.m.	2 p.m. - Midnight	2-8 p.m.	1 - 10 p.m.	

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How Much for Just The MIDI?

A Look Into a Popular Music-Computer Technology

By Eriq Neale, ACS General Access Lab Manager (neale@unt.edu)

*This article was first published in the October 1989 issue of **Benchmarks** (Vol. 10 No. 8, pp. 5-9). It has been updated for inclusion in this issue.*

Computer retailers are hearing about it. Music store salespeople are buying and selling it. Musicians and students are talking about it. Professional writers are publishing articles about it. Entire magazines are devoted to it. Students at the Massachusetts Institute of Technology are receiving large grants to research it. Joe "Keys" Manzotti uses it when he plays with his band at the Holiday Inn on weekends. Just what IS this MIDI thing anyway?

MIDI stands for Musical Instrument Digital Interface and it has been the rage among electronic musicians throughout its almost ten-year existence. It is a powerful tool for composers and teachers alike. It allows musicians to be more creative on stage and in the studio. It allows composers to write music that no human could ever perform. But it is NOT a tangible object, a thing to be had. MIDI is a communications protocol that allows electronic musical instruments to interact with each other.

A Method, Not An Object

All too often I have seen misinformed customers browsing through a music store: "Where do you keep your MIDIs?" "I'd like to get a MIDI for my home computer." "I need to get two MIDIs so they can talk to each other, right?" Explaining to customers that they cannot just get a MIDI becomes frustrating to the salesperson. Fortunately, the average consumer is learning more about the concept of MIDI through articles such as this one. To have a complete understanding of how MIDI works, though, one should learn its history.

The Saga of MIDI

The combined advances and cost-efficiency in synthesizer technology took the music world by storm. At times, a musician could not get a new synthesizer home before it had been outdated by a new product. One major factor influencing the increased popularity in synthesizers, and the increased push for research and design of these units, was the development of new sound generation methods. Musicians were creating new and different sounds worldwide. Eventually, the musical world began to recognize the synthesizer as a legitimate musical instrument.

Musicians were physically limited, though, because they had only two hands. Popular and avant-garde performers alike desired to "layer" their new sound creations, to play two sounds together to create a "larger" sound. Though this was possible to some extent in a multi-track recording studio, layering could not be realized on the road. A few synthesizer design technicians from different manufacturers then got together to discuss an idea they shared. Surely, they said, there had to be a way to play one keyboard and have another one sound simultaneously. They jotted a few notes, considered a few options, and scuttled back to their design labs to create this communication method.

They revealed their results at the first North American Music Manufacturers show in Los Angeles in 1983. The simple demonstration connected two synthesizers, not manufactured by the same company, with two cables. A representative from one company then played one of the synthesizers while an amazed audience heard both sounds. The process was then reversed to demonstrate the two-way nature of the communication. Other variations were illustrated, and the rest is music history.

The Method of MIDI

Much in the same way that two computers communicate via modems, two synthesizers communicate via MIDI. The information exchanged between two MIDI devices is musical in nature. MIDI information tells a synthesizer, in its most basic mode, when to start and stop playing a specific note. Other information shared includes the volume and modulation of the note, if any. MIDI information can also be more hardware specific. It can tell a synthesizer to change sounds, master volume, modulation devices, and even how to receive information. In more advanced uses, MIDI information can be used to indicate the starting and stopping points of a song or the metric position within a song. More recent applications include using the interface between computers and synthesizers to edit and store sound information for the synthesizer on the computer.

The basis for MIDI communication is the byte. Through a combination of bytes a vast amount of information can be transferred. Each MIDI command has a specific byte sequence. The first byte is the status byte, which tells the MIDI device what function to perform. Encoded in the status byte is the MIDI channel. MIDI operates on 16 different channels, numbered 0 through 15. MIDI units will accept or ignore a status byte depending on what channel the machine is set to receive. Only the status byte has the MIDI channel num-

ber encoded. All other bytes are assumed to be on the channel indicated by the status byte until another status byte is received.

Some of these functions indicated in the status byte are Note On, Note Off, System Exclusive (SysEx), Patch Change, and so on. Depending on the status byte, a number of different byte patterns will follow. The Note On status byte tells the MIDI device to begin sounding a note. Two additional bytes are required, a pitch byte, which tells the MIDI device which note to play, and a velocity byte, which tells the device how loudly to play the note. Even though not all MIDI devices recognize the velocity byte, it is still required to complete the Note On transmission.

The command to stop playing a note is not part of the Note On command; instead there is a separate Note Off command. This command also requires two additional bytes with the same functions as the Note On byte. Most people are confused at first by this approach to Note On and Note Off, but after further thought they realize the necessity of the structure.

Another important status byte is the Patch Change byte. This requires only one additional byte: the number corresponding to the program number on the synthesizer. The patch number information is different for each synthesizer, and the standards have been set by the International MIDI Association (IMA). Channel selection is extremely helpful when sending Patch Change commands to a synthesizer.

The SysEx status byte is the most powerful and least understood of all the status bytes because it can instigate a variety of functions. Briefly, the SysEx byte requires at least three additional bytes. The first is a manufacturer's ID number or timing byte, the second is a data format or function byte, and the third is generally an "end of transmission" (EOX) byte. There are a number of books that have been written on the

topic of System Exclusive messages, so this article will not deal with it further.

The INs and OUTs of MIDI

The closest most people ever care to get to the heart of the MIDI interface is the three 5-pin ports found on the back of every MIDI unit. Labeled IN, OUT, and THRU, these ports control all of the information routing in a MIDI system. The IN port accepts MIDI data, data coming "in" to the unit from an external source. This is the data that controls the sound generators of the synthesizer.

The OUT port sends MIDI data "out" to the rest of the MIDI setup. This data results from activity of the synthesizer, such as key presses, patch changes, and so on. The THRU port also sends data out to the MIDI system, but not in the same manner as the OUT port. The data coming from the THRU port is an exact copy of the data received at the synthesizer's IN port. There is no change made to the data from the time it arrives at the IN port to the time it leaves the THRU port (which is a very, VERY small amount of time).

MIDI makes use of five special conductor cables to connect the synthesizer ports. Curiously though, only three of the conductors are actually used. Data is carried through the cable on pins 1 and 3, and pin 2 is shielded and connected to common. Pins 4 and 5 remain unused. Not just any cable will suffice for the exactness of the MIDI system, either. MIDI cable is specially grounded and shielded to ensure efficient data transmission. This means that MIDI cable is a little more expensive than standard 5-conductor cable, but reliable data transmission is absolutely necessary for MIDI.

The length of the cable is critical as well. IMA specifications suggest an absolute maximum cable length of 50 feet because of the method of data transmission through the cable. The entire length of a MIDI chain (discussed be-

low) is unlimited, however, provided that none of the links are longer than 50 feet. The optimal maximum length for cable is about 20 feet, and most commercially manufactured cable comes in five to ten foot lengths.

MIDI Chains and Loops

A MIDI chain describes a series of one-way connections in a MIDI setup. The elemental chain is a single-link chain. The MIDI OUT port of one device is connected to the MIDI IN port of a second. In this configuration, a key pressed on the first unit will cause both units to sound. Pressing a key on the second unit, however, only causes the second unit to sound. Many instruments may be chained together using a series of single links to connect the units. In this case, the OUT of the first unit is connected to the second, the THRU of the second is connected to the IN of a third, and so on. If all the units are set to receive on the same channel, pressing a key on the first one will cause all the units to sound. Pressing a key on any of the other units will only activate the sound of that unit.

A MIDI loop is a special configuration of a MIDI chain. The single element loop is made of two interconnecting links. This was the configuration used in the debut of the MIDI system. The OUT port of the first unit is connected to the IN port of the second, and the OUT port of the second is connected to the IN port of the first. In this case, as described earlier, a key pressed on either unit causes both units to sound, provided they are on the same channel. A MIDI feedback loop does NOT exist here, as the data going into the second unit from the first is not duplicated in the OUT port of the second going back into the first. Here, we have two one-way links connected, not a multi-link chain.

MIDI loops connecting several devices using all three ports can become complex very quickly. As a brief example, imagine four synthesizers named A, B,

C, and D. A's OUT is connected to B's IN and consequently to C's IN via B's THRU. B's OUT connects to D's IN, whose THRU connects to A's IN. A key pressed on A sounds A, B and C. A key pressed on C sounds C and C alone. A key pressed on B sounds B, D, and A, while a key pressed on D sounds D only. C does not sound when B is pressed because there is no direct connection between B and C, and B's note, which does route through D, does not route through A into C because A's THRU is not connected to C, or anything else for that matter. A note played on A does not sound on D for the same reason. You get the idea.

Computers and MIDI

Computer manufacturers soon realized that the computer would be a fantastic tool for MIDI, since MIDI devices and computers speak the same language. Since the MIDI data transmission rate (31.5 kBaud) is different from ANY computer data rate, manufacturers had to design a MIDI interface to allow the computer to talk at MIDI's speed. Apple Computers, with the Macintosh and Apple II series, and Commodore were the first companies to jump on the MIDI computer bandwagon [pun intended]. Roland designed an interface for the IBM series of compatible computers a few years later, and Atari designed a completely new computer, the ST series, with fully operable MIDI ports built in. Today, there are many different interfaces available for almost all types of computer systems.

As large as the number of available interfaces may be, the availability of software packages is almost beyond belief. Virtually everything that can be done via MIDI has a software package to do it. First came the sequencers. Based on a hardware device that simply recorded and replayed MIDI data, the software sequencer allowed the computer to record, store, replay, and edit

Please see MIDI on page 6.

Quicktime: Bringing Movies to Your Desktop

By Sean McMains, ACS General Access Lab Monitor (mcmains@cc1.unt.edu)

Quicktime is one of those rare technologies that combines immediate obvious benefit and a high "Wow Factor" with a potentially far reaching impact on how data can (and will) be processed on personal computer platforms.

The immediate draw is that by installing Quicktime on your computer, you can immediately, without any fuss or any extra hardware, play movies on your computer. Admittedly the movies are small and sometimes pretty jerky, but they are happening. With a little bit more hardware (the Video Spigot board, which costs around \$300, for example) you can make digital movies of your own and send these files to all of your friends who have a machine running Quicktime.

"Surely there must be a catch!" I hear you exclaiming. Well, yes there are a few. First, Quicktime is currently available only for the Apple Macintosh and Iris Indigo Workstation computers, though there will very likely be a version that will run under Windows in the not too distant future. Even if you are using a Macintosh, the current iteration of the software will only run on a machine with a 68020 processor or better, which means that anyone with a Mac Plus/SE, a Mac Portable, or a PowerBook 100 is out in the cold. Quicktime movies also consume quite a bit of disk space, even with the compression that is built into the software. Beyond these limitations, the software pretty much delivers as promised.

"Real Work" with Quicktime

Once the novelty of playing movies on your computer screen has worn off, you may begin to wonder what advantages Quicktime will afford you as far as Real Work is concerned. The most immediate is that, since Quicktime is system level software, anyone that wants to can easily write any programs in support of it with a minimum of additional coding. For example, with the latest version of WordPerfect for the Macintosh one could give a friend a disk with a press release for a great new band, and the friend could not only read the copy in the word processor, but he could click on a button in the document and see a clip from their latest video.

Quicktime is more than movies, though. It is system-level support for time-based information. What that means is that although video and audio are the most commonly used type of media in Quicktime files, they can also store other time-based information, such as readings from lab instruments, or, in an upcoming update to Quicktime, MIDI information.

Another exciting outgrowth of this new technology is desktop video post-production work. Though the size is small and the frame rate is low (usually about 15 frames per second) on a standard Macintosh, additional video cards allow the computer to play full-screen 30FPS (or 29.97FPS, for you video purists) video, just like television. Even if one is not interested in producing the final product on the desktop, with the use of a Quicktime editing program such as Adobe's Premiere or Diva's Videoshop, one can assemble EDLs (Edit Decision Lists) which can be used to put together the final product. One can load raw footage into the computer, do all the editing in the machine with a Quicktime movie to show a thumbnail of the final product, and take the EDLs that the program generates with the raw footage to a

post-production studio to have it assembled into a finished product in a matter of hours, rather than the days of studio time often required.

How does it *do* that?

How does Quicktime do its magic? There are several parts to the software. The most important is the Quicktime system extension, which contains the main functionality of the software. It has the code to play back video and sound, keeping them in sync and dropping video frames if the processor can't keep up with decompressing and displaying them in real time. This is necessary because if the software didn't drop frames on slower systems, the sound would quickly outdistance the video and one would experience the computer equivalent of a Milli Vanilli concert: bad sync. It will also adjust the video portion to be shown at whatever bit depth your monitor is currently set for, dithering the image information to produce the best possible display on your hardware. The software also runs interference between the hardware and software, allowing any program written with Quicktime in mind to take advantage of any additional video hardware, present or future, without any additional coding. Finally, Quicktime also includes several compression/decompression modules, or codecs, which provide different means of compressing the data in Quicktime files. These also can be added as new ones become available and will instantly be available to all Quicktime software.

The future

The future of Quicktime is promising. Apple Computer, which is responsible for the Quicktime software, is determined to make it a cross-platform standard for time-based information. They seem to be getting support from the major players in the game, and I would expect to see Quicktime for the

PC soon as soon as details can be ironed out with one of the major PC operating system manufacturers, followed in the not-too-distant future by support for other platforms. MIDI information will be supported in the next release of the software, and it is rumored that the machines with the older 68000 processors will be supported as well. Quicktime is rapidly going to become part of the computing world. With its advent, desktop multimedia is a significant step closer to reality. Even more importantly than that, **it's free!**

Quicktime can be obtained by anonymous FTP from Apple Computer at <ftp.apple.com>. For further information, consult "Grabbing Quicktime" in the box below. ■

Grabbing Quicktime

To get your free copy of Quicktime, you need to have access to a host system that supports the use of ftp. On the UNT campus, ftp is supported on the VAX, Solbourne, and CMS. You can also use ftp from your PC or Mac in certain situations (contact ACS at 565-2324 for further information). Once you are on a host system that supports ftp:

- Type **ftp ftp.apple.com** <RETURN>
- At the Name (**bric-a-brac.apple.com:userid**): prompt, type **anonymous** <RETURN>
- At the Password: prompt type **your Internet User-ID**
- Type **cd /dts/mac/quicktime**
- Type **binary** <RETURN>
- Type **prompt** <RETURN>
- Type **hash** <RETURN>
- Type **mget *** <RETURN>

At this point, all the files in the quicktime directory will be delivered to you on your host system. You will need a copy of binhex or stuffit to uncompress the files. If you need help with this, contact ACS at 565-2324. ■

MIDI continued from page 5.

MIDI data into "songs." Though the first sequencers were somewhat primitive, the packages available today provide very thorough editing capabilities as well as intricate synchronization methods, such as MTC (MIDI Time Code) and SMPTE.

Various patch editors and librarians are also available for computers. These programs allow the user to edit sounds away from the synthesizer, and often in a much friendlier environment than what the synthesizer interface offers. The more advanced librarians permit groups or banks of sounds to be edited, stored on disk, or moved back and forth from the synthesizer's memory. They also allow for rearranging sounds within banks or groups of banks for customized libraries. These programs are generally small and can be incorporated into some sequencing packages for ease of use. On the other hand, each synthesizer requires a different editor/librarian since internal data formats are unique for each. Some packages offer editor groups for a specific manufacturer's line as some of the internal data structure may be similar

between the units. There is not yet a universal librarian that covers all makes and models of sound modules; it would just be too large.

Computers in MIDI Chains

Basically, the computer functions the same as any other unit in a MIDI chain or loop. Most interfaces have the same three ports as other MIDI devices. The computer's main job in a chain, though, would be as a MIDI data driver, meaning it would supply the MIDI data for the rest of the chain. Very rarely is a device connected to the IN port of a computer MIDI interface except to provide input for synchronization signals or data to edit. Even more rare is a connection to the computer's THRU port, although it can be used.

In this scope the implementation of MIDI channels is most effective. The computer can send data out on all 16 MIDI channels simultaneously. For example, sixteen MIDI devices, each set up for a different MIDI channel, could be connected to the computer. Each unit could be playing a separate line in a song from the sequencer, creating an electronic orchestra. This implementation is being used more and more in today's music scenes: the recording studio, major orchestras, opera, and film scoring.

The Future of MIDI

The MIDI specifications set out by the initial design team have not changed drastically since its creation. The current data structure is as it was originally designed, the only exception being that some of the initial status bytes were not initially defined. As it stands, the architecture of MIDI does not allow for any further expansion. To enhance MIDI further would take a complete redesign of the system. The IMA has been discussing new MIDI designs, but industry and the general public will prevent any real action from taking place because the new design would not be

backward compatible: none of the current MIDI hardware would operate in the new environment.

But MIDI does continue to hold promise. The extent of the SysEx applications has not yet been fully realized. MIDI is by no means about to become outdated or abandoned by the musical world, and as technology becomes more and more affordable, a greater number of non-technical people will invest in their own personal MIDI systems. There may in fact be a day where the average American family has a home, two cars, three kids, and their own MIDI in the garage.

Windows Multimedia: MIDI for the Masses?

With the onslaught of Multimedia Windows has come a kinder, gentler approach to MIDI. Windows 3.1 has native MIDI support for several sound cards and other MIDI adapters through specialized MIDI drivers that can be installed directly into the system. This adds another interface layer on top of computer MIDI that tends to be more easily understood. Windows 3.1 includes a MIDI Mapper interface that, depending on the sound card used, allows a user to configure the way an application uses the sounds on the card. This is useful since a number of new Windows applications are being released with sound capabilities.

There is also a new breed of software sequencers designed to work under Windows. These have been built to interface with the Windows MIDI driver so almost any of the new sound cards that have MIDI capabilities can be used without having to reconfigure the application. Previously, software was written to interface with a particular interface, and the most common interface used was the Roland MPU-401. The 401 is still the most common and most compatible of the PC MIDI adapters, but it never offered any sort of sound board in addition to the adapter.

If you use one of these newer software sequencers, you can change out your card, or better yet, use your sequences on another computer with a different MIDI adapter and not worry about losing any of your MIDI data.

Are more people going to be using MIDI as a result? Absolutely. In fact, there are a number of Windows users out there that aren't yet aware of just how much they are already relying on MIDI. As they become more familiar with what their sound card is doing, they will explore creating their own sound configurations, and possibly even creating their own music, using Windows MIDI. MIDI's user-friendliness supports the strong foundation for MIDI use in today's, and tomorrow's, technologies.

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That Old PC, She Ain't What She Used to Be

By Eriq Neale, ACS General Access Lab Manager (neale@unt.edu)

The PC compatible computer on your desk is the same 8088 4.77MHz green phosphorescent dinosaur that you got back in the mid 80's, right? Wrong! PC compatible computing has evolved significantly since Big Blue first convinced us to put "real computing power" on our personal desktops. But even though we now have faster and larger computers, our interaction with the machine has stayed pretty much the same since it first came out. Oh, sure, we have new interfaces we can oooh and aaah over and mice that can supplement our keyboard, but the interaction hasn't changed much. Do something at the keyboard (or mouse), see something on the monitor (or printer). Same ole, same ole — until recently.

Someone not too long ago thought it might be a neat idea to try adding parts to a PC and give it "multimedia" capabilities. Revolutionary new thought? Well, multimedia is not a new thing. There have been multimedia software packages for the Macintosh and Amiga available for years now. And even before that, people have been doing multimedia the "old fashioned" way, by hand. Check out Laurie Anderson's concert video "Home of the Brave" to see just how high-tech multimedia was as far back as 1984.

Yet we're in the middle of a marketing frenzy these days, with both hardware and software manufacturers jumping on a new bandwagon, the Multimedia PC. Some of the advertising implies that someone developed this idea from scratch a couple of years ago, breaking new ground at the same time. This is the greatest thing to happen to the computer industry, right? Well, let's cut through some of the hype and see for ourselves.

The MPC

The MPC logo is seen on several hardware and software packages these days. But what does it mean to you and me? MPC stands for Multimedia PC and it is a set of hardware and software standards devised by the Multimedia PC Marketing Council. These standards represent a "minimum functionality" for items to have in order for a system to "do multimedia" (whatever that is). Note that the MPC Council does not certify any products that carry the MPC logo, but a company must be able to advertise that their product meets the minimum standards before they can use the logo on their packaging.

Items sold under the MPC logo include both component-level and system-level products. There are several major computer vendors that now sell complete Multimedia PCs so you don't have to put the pieces together yourself. Or you can go and buy additional parts to add to your existing PC. But what parts put together add up to a fully multimedia PC? Let's find out.

Multimedia Pieces

The basic components you need for a multimedia PC include:

- ❶ A CD-ROM drive.
- ❷ A sound card.
- ❸ A high-end graphics card and monitor.
- ❹ At least a 386SX computer.

There are a number of different options available in the CD-ROM and sound card arena, too many, in fact, to mention here. The major PC magazines have been reviewing CD-ROM drives and sound cards in recent months, and with the sound card market as volatile as it is right now, there will be reviews for the next year at least. Sound cards have a wide range of abilities, but the biggest reason to go with one is that the PC speaker is capable of a couple of good beeps, and that's about it. Today's sound cards can play back audio samples, otherwise known as waveform audio; some have small synthesizers inside that can play several different sounds as well as drum sounds at the same time; there are a few that also offer digital sampling, and some with audio quality to rival CD audio. Of course, you get what you pay for, but the "average consumer" can pick up a higher end audio card in the \$300-400 range. Not bad. Needless to say, you will also need some sort of speakers to play the sound from the card. Some units can power speakers themselves, others require self-powered speakers to be connected. Some even plug into a home stereo nicely with a good sound and little extra expenditure.

As with sound cards, CD-ROM drives are many and varied. These drives operate significantly slower than your average PC hard disk, but are capable of storing quite a bit of data in a convenient, portable package. Most CD-ROM drives also offer the ability to play your own audio CDs while you're doing

something else on the PC. That itself is a rather nice feature.

Connecting your CD-ROM can pose a potential problem, though. Some sound cards have CD-ROM connectors built into them, others do not. The potential for interrupt, IO address, or DMA conflict if you use a CD-ROM with its own controller and a separate sound card is more likely than can be ignored. If you plan to purchase CD-ROM and sound separately, investigate the parts thoroughly.

Most people are using VGA graphics these days as their base-level monitor system. VGA is really a minimum for any kind of multimedia, but a higher level VGA system will yield better performance. This fact holds true for most PC applications anyway. Several computer commentators will tell you that you need a SuperVGA card and monitor combo with a graphics accelerator to be able to run Windows at a reasonable level. Full-motion video and graphic animation appear smoother with a more powerful graphics card and monitor. Currently, MPC does not have a minimum standard set for video, although new video technologies are being designed to deal with the massive amount of data that video entails. There are a few cards that are designed for full-motion video, including NTSC, on your SuperVGA monitor.

Finally, your base computer is probably the most important part of the whole system. Although it is possible to run multimedia applications on a 386SX with, say, 4MB of memory, performance is not going to be ideal. Here, the rule "more is better" applies, up to a point. Many authors and consultants are recommending a 33MHz 386DX with 8MB of RAM as a bare minimum, and if you can get your hands on a 486, more power to ya. Oh, and a larger hard disk, something on the order of 120-200 MB, is a good idea too, as multimedia software and files tend to be larger than your average bear. Since the application is really going to be the deciding factor

in what hardware is needed, let's take a look into that area.

Multimedia Applications

Multimedia applications come in just about every shape, size, and color imaginable. The biggest push right now is coming from Microsoft (the company behind the MPC Council) for its Multimedia Windows product, Windows 3.1. A number of new multimedia applications being released operate under the Windows 3.1 environment, but not everything. OS/2 users have had several multimedia packages for a few years, allowing them to create multimedia presentations. There are also packages that operate straight from DOS, having their own interfaces to interact with.

Further Information

You can get more information about multimedia applications from a number of different sources. Again, several

of the major PC magazines are reviewing these applications since many new ones are being released almost weekly.

You can also refer to the March/April 1992 issue of *Benchmarks*, which has quite a few articles on multimedia. Copies are available in the Computing Center, ISB 119.

Conclusion

We can see that finally a significant change in human-computer interactions has occurred with the onslaught of multimedia for the PC. It will be interesting to see what new technologies result from this change, and how much more efficient, or inefficient, the workplace becomes as a result. Will the MPC craze die off quickly? Hardly, considering the amount of marketing going on currently. We can hope, however, that a better definition of hardware standards and software capabilities will emerge soon and solidify the place of multimedia in our computing environment. ■

MIME: Multimedia Across the Internet

By Mark Thacker, CC1 LAN Manager (Thacker@cc1.unt.edu)

Electronic mail is a way of life and a standard means of communicating for many people here at UNT. Communication between people here on campus is relatively reliable and most people don't think much about sending files from one microcomputer-based mail system to another. However, when users need to communicate to our hosts systems (VAX, Solbourne, Ponder, etc) they experience the limitations of Simple Mail Transfer Protocol (SMTP).

MIME, written by Nathaniel Borenstein of Bellcore and others, proposes a standard for SMTP message exchange that will allow a whole variety of files to be transferred between ANY mail system. Messages will preserve their structure (a message with actual attachments), can contain image/voice/movie and other binary files, will not require manual decoding of attachments by the user, and can contain *richtext* bodies for **bolding**, *italicizing*, underlining and other font changes. Best of all, users may not need to change from their favorite mail system to use MIME.

Why SMTP Forced MIME to Evolve

Simple Mail Transfer Protocol (SMTP) is the protocol used by a variety of host systems to communicate mail across the world-wide Internet (see *Introduction to the Internet* from ACS for more information). SMTP is indeed very simple and VERY popular. Because SMTP is considered the *de facto* standard within the Internet community, mail systems that support it are considered a requirement for a campus wide mail system here at UNT.

However, it is SMTP's simplicity that brought forth the need for MIME. SMTP is based on 7-bit ASCII format documents. These type of documents are expressed strictly from displayable characters. This restriction allows SMTP mail to pass between a variety of computers with different operating systems and still be received in a perfectly readable format. Note however that 7-bit ASCII precludes sending binary format files. Binary files are typically 8 bits in length. Binary files include program executables, word processor files, graphic images, audio and others. SMTP does not have any facilities to handle attached mail messages — they simply don't exist in the SMTP world; MIME provides this capability.

The lack of ability to transfer these binary files has lead to a great deal of frustration. Users can not send files as attachments to host systems. Binary files such as WordPerfect Documents, graphics, voice or any other data, are completely out of the question unless you use something to convert the file to an ASCII format. Fortunately, some mailers such as Pegasus Mail will handle this conversion for you and will send attachments as separate mail messages. But once the file is received, the host user still must decode the files by hand. This is where MIME comes in.

Please see MIME on page 11.

The Network Connection



By Billy Barron, VAX/UNIX Systems Manager (billy@unt.edu).

This column is a continuing feature of Benchmarks intended to present news and information on various aspects of wide area networks.

X Marks the Spot

Back in the February 1992 issue of *Benchmarks* (Vol. 13, No. 2, p. 8), we discussed the X Window System and its future at UNT. Since that time, the X Window System is becoming more and more visible around campus. In addition to the three NCD 17c X terminals that have been in the ISB 110 lab, the College of Arts & Sciences has installed five NCD 19c X terminals recently in the GAB third floor lab. We have also recently purchased a site license for MacX (X for the Macintosh). We are not yet ready to deploy MacX because we are doing some in-house testing and development of installation procedures. (Look for further announcements about X and MacX in future issues of *Benchmarks*.)

Multimedia and X

X is being used for more and more multimedia applications. The major defect in the protocol is that sound is not directly supported. Most X terminals can not generate any sound except a beep. To get sound, you usually need to be directly on a UNIX workstation running X.

One of the most important developments in the X multimedia realm was the development of the Metamail package that allows MIME (see article on page 9) messages to be displayed on any X display. MIME will allow users across the world to exchange multimedia documents.

Audioconferencing and Videoconferencing

One of the hottest areas of Internet research is audio and video conferencing. All of the available software uses X to display and control the conference. To show that this kind of technology was possible, the Internet Engineering Task Force meeting was broadcast over the Internet. People in 16 different time zones listened in by using the public domain VAT software. The remote people could even ask questions to the speakers over this system.

Sun, as well as other vendors, has released conferencing software. The Computing Center will be receiving a demo copy of their software, ShowMe, in the near future. This software has the ability to take anything that is displayed on the workstation and show it to all the conference participants. This includes the viewing of slides, documents, and pictures.

The potential cost savings to UNT, on travel alone, are enormous if this technology works. Currently, the Internet does not have enough bandwidth to adequately support widespread videoconferencing, but that should be changing over the next few years. UNT, as well as most of the world, is at least a couple of years away from deploying a videoconferencing system. When we do, just think of the potential of having a meeting between yourself, someone in Japan, and someone in France without anyone

leaving their office. Normally, this meeting would have cost several thousand dollars and with videoconferencing, it will cost a mere fraction of that.

X versus Display Postscript

Multimedia applications between various UNIX platforms generally work pretty well. However, the NeXT is an exception to this rule. Instead of using X like the rest of the UNIX industry, they used Display Postscript for their windowing environment. Display Postscript has its advantages, but interoperability is not one of them. X is available for the NeXT at an extra cost. Also, NeXT's multimedia mail, NeXTmail, is not compatible with the MIME standard, which is understandable since NeXTmail predates MIME by a couple of years.

Conclusion

The X Window System has many uses in the Multimedia world. Over the next few years look for more and more X based Multimedia software to appear on the market. ■

MIME continued from page 10.

Features of MIME

One thing needs to be made clear about MIME, it is **NOT** a mailer package. Nor is it a new protocol in the formal sense that it would require new mailers to transfer it. It **IS**, however, a standard way of exchanging multimedia mail messages that is backward compatible with all SMTP mailers.

MIME specifies a standard way to encode and attach files and messages to SMTP mail messages. It also maintains that mail messages should be completely compliant with RFC-822 and RFC-821, which define SMTP Mail. In fact, all MIME messages, even if they contain full-motion video and audio highlights, will be sent

List of the Month

Each month we will highlight one BITNET, Internet, or USENET Special Interest Group (SIG) mailing list. This month's list...

MMEDIA-L on LISTSERV@VMTECMEX — Multimedia

The Multimedia discussion list has been opened in order to provide a forum to discuss this growing field in education and training. It is a listserv list located at MMEDIA-L@VMTECMEX. Please send your commands to LISTSERV@VMTECMEX.

The list runs unmoderated with monthly logs available.

Owner: Alejandro Kurczyn S. <499229@VMTECMEX>

To subscribe to the above mailing list send the following command via either an interactive message or as the first line of a mail message to the BITNET address LISTSERV@VMTECMEX: SUBSCRIBE MMEDIA-L yourname, where "yourname" is your first and last names. ■

through the Internet as a completely printable 7-bit ASCII file.

MIME is also compatible across multiple platforms. Because MIME preserves the binary format of the file, a user can send a DOS WordPerfect file to a Mac user without having to worry about converting it to ASCII text first. WordPerfect for Mac happens to read DOS WordPerfect files, so the receiving user simply saves the file in native format and opens it using WordPerfect for Macintosh. Note that MIME does not *translate* the file, but it does preserve the original binary.

MIME offers the following types of files to be attached:

- ☐ **ASCII text** — What we already know and love, but it includes any of the ISO-8859-x character sets for fonts such as Japanese, Hebrew, French, and Latin.
- ☐ **Richtext** — Allows *italics*, **bolding**, underlining, font changes and other formatting features that may even be displayable on a VT-100 terminal.
- ☐ **Multipart** — Multiple messages of different types are attached and displayed either sequentially, in parallel (a graphic image and descriptive audio at the same time) and in *digest* format for mailing list type items. It also allows multiple files to be sent though mail and reassembled by the MIME mailer.
- ☐ **Image** — GIF, JPEG still pictures and Group 3 FAX files to be displayed on the reading terminal or saved to a file for later viewing/printing.

- ❑ **Audio** — basic telephone quality sound for annotating a mail message (see the "Future" section of this article for more information about higher quality sound).
- ❑ **Video** — MPEG compressed full-motion video (see **Future** for more information about different formats for full-motion video).
- ❑ **Application** — PostScript and other interpretive scripting languages that may allow for interactive dialog and surveying via E-Mail.

Avoiding Data Crush, Send a Pointer Instead

You might be thinking, "Wow, I can send all of this multimedia data through the mail system and really bog the whole thing down!" MIME has taken care of this possibility also by providing a mechanism to specify where a file is and how to get it rather than including the actual file in the mail message itself. The following ways of specifying a file's *external body location* are included:

- ❑ **FTP,TFTP** — Standard File Transfer Protocol host and location. You must provide a valid login account and password for remote machine.
- ❑ **ANON-FTP** — Anonymous FTP with host and location. You need not provide login information as ID of ANONYMOUS is assumed.
- ❑ **AFS** — The Andrew File System as used by CMU. Not UNT related.
- ❑ **LOCAL-FILE** — File's location on the local machine (NOVELL file server for instance or the host machine).
- ❑ **MAIL-SERVER** — A Internet/BITNET mail-server and the command needed to have the file sent to you.

One can begin to see how incredibly efficient this form of document mailing can be. For example, if you wanted to

send the latest form of the F-Prot virus protection software to all of your users, use the LOCAL-FILE distribution method. Your mailer would allow you to specify where on the file server to find the file, FPROT.ZIP for example, and you would send a *reference* to the file rather than the file itself. Your users could have their mailer program retrieve the file as they needed it and save it to their local drives. The savings in mailer overhead and wasted drive space would be substantial versus sending the file itself to users.

Those of us with more esoteric need might send each other references to FTP sites with software that we need or (perhaps a bit in the future) references to Gopher servers (see the June 1992 issue of *Benchmarks* — Vol. 13, No. 5, p. 8 — for more information) or other Internet resources. Suddenly, multimedia mail takes on a whole new dimension!

Nuts and Bolts, But No Welding

Sounds promising right? But how do you send all of this data over the line? How could I say earlier that you may not need to switch mail systems? How does one make a standard SMTP mailer understand MIME fully?

MIME was designed to be added to existing mail systems and also to be integrated into mail systems in the development stage. It performs its magic by adding several new descriptive lines to a message. These new lines describe a message's *content type*, *content encoding*, *unique ID* and *format*. All of these new lines appear after the standard RFC-822 (SMTP) header and are parsed by a MIME-compliant mail system. Because these new fields do not affect the standard header, MIME messages are still perfectly valid SMTP messages and can be handled by all SMTP mailers.

A MIME-compliant mail system does one of two things when it receives a message:

- ① Decode the parts, create the proper sequence of items and display each part using the appropriate display method that is coded internal to the program, or
- ② Decode the parts, recognize the order of display and, for each part, call the METAMAIL program which determines the best display method and acts upon it.

The former case requires building a MIME-compliant mailer from the ground up, or at least modifying the code for the mail system substantially. The latter case requires modifying the mail system's codes slightly to parse for MIME message parts, but the display and determination of what to do with each type is left to the (included) METAMAIL package to perform.

METAMAIL is essentially a giant switch. On most systems, it consists of a MAILCAP file and the METAMAIL executable. When a MIME-compliant mail system calls METAMAIL, it passes it a part of a mail message. METAMAIL looks at the MAILCAP file for that part's *content type* field. If it finds it, it will determine what program to launch, whether this program should direct its output to a screen pager and whether this part requires opening a new terminal window for interactive input.

As a testament to ease of implementation, a document by Nathaniel Borenstein, "Adding Diverse Multimedia Format Support to Established RFC-822 Mail and Bulletin Board Readers," includes code to modify several existing mail programs. Most of the code consists of small (less than 50 lines) code sections that simply need to be compiled. From then on, the mail system understands MIME and uses the flexible MAILCAP file to determine what type of parts it will display.

A MIME Message Example

In the following message, I use a variety of MIME capabilities to show how a message appears to non-MIME mailers as well as what the user should see on a MIME-compliant system. As you read through this example, notice how most of the parts "make sense."

```
From: Nathaniel Borenstein <nsb@thumper.bellcore.com>
To: Mark Thacker <Thacker@ccl.unt.edu>
Subject: Neat MIME message you can't do with WPO Mail
Content-Type: multipart/mixed; boundary=FOOBAR

This text is 'invisible' since a MIME reader will
parse between the BOUNDARY word FOOBAR. Normal SMTP
mail will see as you do.
-FOOBAR
Content-type: text/plain; charset=US-ASCII

Normal text goes here. Note that character set is US-ASCII;
it could have been something like Hebrew, French, etc...
First 'part' of message for MIME mailers.
-FOOBAR
Content-Type: audio/basic
Content-Transfer-Encoding: base64
(A whole bunch of HEX here that is an audio sound)
-FOOBAR
Content-Type: message/external-body; name="BodyFormats.ps";
site="thumper.bellcore.com"; access-type=ANON-FTP;
directory="pub/nsb"
Content-type: application/postscript
-FOOBAR
Content-type: text/richtext

Pretty <italic>NEAT/italic>, eh? Notice the <bold>dramatic/
bold> font changes
-FOOBAR-
```

As you can see, there are a few special keywords that MIME expects to find in the message. Note that as the user, you would not normally define or type these keywords/phrases yourself. The mail system would ask you questions that it would use to compose such messages.

A normal SMTP mail program would display the message exactly as above. The advantage that you get is that later, you could read the same mail message with a MIME-compliant mail system and get all of the multimedia capabilities. A MIME-compliant mailer would display something like the following:

```
From: Nathaniel Borenstein <nsb@thumper.bellcore.com>
To: Mark Thacker <Thacker@ccl.unt.edu>
Subject: Neat MIME message you can't do with WPO Mail

Normal text goes here. Note that character set is US-ASCII;
it could have been something like Hebrew, French, etc...
First 'part' of message for MIME mailers.
```

Click for Sound

Body Formats A PostScript File

This PostScript file was downloaded and then displayed in either a window inside the mail system or from a separately launched application.

```
. (PostScript file
. continues)
```

Pretty *NEAT*, eh? Notice the **dramatic** font changes.

As you can tell, a MIME message is much more detailed in its final appearance than a typical mail message. Keep in mind that this example assumed something like Windows, X-Window, Macintosh, NeXT for the display of the message; a VT-100 terminal would still be able to receive all parts of the message, it just could not "display" the audio or PostScript.

What MIME Needs Now

As I have pointed out, MIME is available for patching into existing mail systems now. MIME needs support and development now. More than anything, developers need to be working on incorporating MIME into their mail systems. If MIME becomes the Internet's multimedia solution (which there is no reason to think it won't), there will be over 14 million users needing mail systems with MIME support.

There are already quite a few mailers available now and more on the way every day. However, because MIME is in the public domain and no one makes any direct money off of the standard itself, commercial developers have been slow in adopting it. For most developers (read WordPerfect, CE Software, etc...) it is due to a lack of information. Most simply don't realize that they can add cross-platform, multi-

media mail by adding a few parsing statements to their programs. The included METAMAIL program will do the correct application-to-content-type launching for them.

Future of MIME

As with most technological changes, the future is where MIME holds great promise. MIME could change in the following ways:

- **Sound support enhanced** — There is no reason why full 16-bit digital stereo sound should not be supported. The standard *base64* encoding technique could be used for machines capable of high-quality sound.
- **Other full-motion video** — Products like Apple's QuickTime movie technology, which is designed to be platform independent, could be encoded and sent. As more QuickTime players are introduced, we could see demand from a variety of platforms.
- **Interactive applications** — One of the co-authors has started a project called AtomicMail, which promises a safe, multi-platform programming language that would be executed inside of a mail reader. The user could request files, complete surveys, send electronic forms or send FAXes.
- **More Internet resources** — Items such as Gopher, WAIS, WWW could be links in a MIME message. Users who then wanted to provide a new resource to others need only mail out a pointer to it.

MIME also has implications for non-mail systems, especially for Usenet NEWS readers. MIME has been adopted by a majority of the NEWS server authors as being the best way to provide the world with multimedia news items. Thousands of news items are posted every day and there are a variety of "standards" used by posters

for providing binary files. MIME would unify them all and provide Internet resource pointers.

Conclusion

Finally, one should realize that the days of multimedia on the Internet are here. No longer are we restricted to sending each other ASCII text only messages. Files and multiple binary images can now be sent without having to worry about encoding the files, or (worse yet) decoding the files once they have passed through dozens of machines on the Internet.

As more and more people at UNT use the Internet to communicate, they will need MIME abilities. They will need the ability to send mail messages with attachments across the world and have the user on the receiving end see one final message — not dozens of broken up parts. It is comforting to know that

the Electronic Mail Task Force is weighing support of MIME when evaluating products.

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Borenstein, Nathaniel. "MIME: The Proposed Standard for Enhanced Internet Mail." *Tutorial for CSCW 1992*, Toronto, Ontario, November, 1992.

Borenstein, Nathaniel and Ned Freed. "MIME (Multipurpose Internet Mail Extensions): Mechanisms for Specifying and Describing the Format of Internet Message Bodies." March, 1992. *Internet RFC-1049*. ■

Design and Performance Criteria for a Proposed Integrated Instruction and Information System for UNT

By George Mitchell, Coordinator for Development and Grants, UNT Libraries (fa78@untvax)

Integrated instruction and information systems (IIIS) are network-based and intended to enhance and generally replace the current system of stand-alone installations and mobile playback devices, microcomputers, and projectors. Not only are current systems excessively dependent upon staffing, but their mobility and/or complexity tends to make them unreliable.

Working under a request from the Director of Libraries, Dr. B. Donald Grose, I conducted a study of existing state-of-the-art multimedia delivery systems. I learned that several of the most advanced systems could be seen operating in Indiana. When I visited the IIIS sites in Indiana, I found the staff and faculty using them pleased that they were freed to unhesitatingly choose to use the most appropriate learning technologies.

Six major components comprise an IIIS system:

- ① **Display device(s):** A video/data monitor, or projector with screen, appropriate to the size of the classroom, permanently installed.
 - ❑ Displays are required which allow instructors to use both data/computer-based and image-based technology. Installation is required to assure reliability since mobile displays can be moved, lost, stolen, and are more readily damaged. Installation also eliminates the need to request delivery of a display device.

② **Access and control system:** A box and/or connectors, mounted in the classroom and linked to the display devices, that permits switching between both centrally-accessible source equipment and mobile, instructor-provided equipment as needed.

□ The system should include secure connections to the room display as well as both permanently installed and removable remote controls and/or keyboards for access to central or distributed storage media and files, and they must be secured by either a password or key system. The control module must be simple in design and control all equipment similarly, very like the commonly available universal remote for home video/ audio systems. At least six different sources must be selectable, controllable and readily switchable through the access and control systems, so as not to limit instructors in choosing the most useful learning resources. The design should include a direct link to computers with databases and files useful for particular classes/courses, regardless of location within the University. Prototype work on this aspect of the design has been done successfully at the University of Notre Dame in cooperation with the vendor Dynacom. The access system also must provide for toggling between the current device in use, and other devices prepared for use, moving readily between the current image and the last image seen on any of the six devices.

③ **Connectivity:** Must provide sufficient bandwidth to handle data, graphic models, full-motion video either in analog or digital form.

④ **Central and distributed resource equipment** including switchers and software. This equipment should enable the system to respond to in-

structors working in any teaching space on campus or in the region.

□ Examples of types of source machines needed include those which can play several types of videotapes and laserdiscs, video floppy files (to replace overhead transparency projection), 16mm films, sound/slide programs, sound filmstrips, several types of audio recordings, and transmit satellite broadcasts, as well as a variety of microcomputers, file servers, CD-ROM towers, and gateways to local and national computer networks.

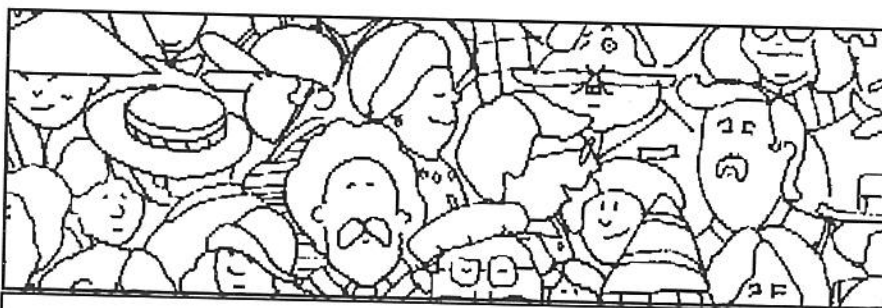
⑤ **Telephone access:** Inevitably, with the best systems, there may be some telephone consultation needed to solve a problem or respond to a needed change. Another use of the telephone is to enable live interviews with subject specialists at other universities and to facilitate participation in teleconferences.

⑥ **Instructional material preparation area** with basic equipment,

such as scanners, digitizing software, Canon Xap still video cameras, basic computer graphics systems such as Amiga and/or VideoToaster, etc., for hands-on use by both faculty and students.

It would be salutary if UNT could at once install comprehensive integrated instructional/informational systems campuswide. IIS would support the assignment of class sections to a particular facility without regard to the particular learning technology equipment readily available in a given space. Users would find equivalent, state-of-the-art equipment wherever they might be assigned. Faculty would find using technology rewarding rather than frustrating.

The design described, along with suggestions for prioritizing the development of IIS at UNT, were submitted to the Instructional Technology Task Force, which recommended that this campus-wide media delivery project be supported. This report is now in the hands of the Provost. ■



BENCHMARKS FORUM

BENCHMARKS FORUM is intended to serve as a vehicle for answering questions that may be of general interest to the user community. If you have a question, please send electronic mail to the Benchmarks editor (as04@unt.edu) or write it down and drop it by the Computing Center. We will try to answer it in the next issue.

Question: I keep seeing X Window in *Benchmarks*. Is this a grammar mistake and it should be X Windows? It has more than one window, right?

Answer: Yes, it does have more than one window. However, MIT, who originally developed it, called it "the X Window System." According to MIT, other correct terminology is X, X11, X11R4, and X11R5. The R and then a number is the release of the software. Even though X Windows seems more correct, it is not. ACS tries to conform to industry-standard terminology, so we will continue to use X Window instead of X Windows. ■

Computing Center Staff Activities

Academic Computing Services

Billy Barron, VAX/UNIX Services Manager, has had two more articles published. His article, "Full Text Online" appeared in Volume 1, Number 2 of the *Internet Society Newsletter*. "Symbiotic Cyberspace Libraries," appeared in *Thinking Robots, an Aware Internet, and Cyberpunk Librarians*, a collection of background essays prepared for the 1992 LITA President's Program. LITA is the Library and Information Technology Association.

Transitions

New Employees since June 1, 1992:

NAME	POSITION
Bruce Pollock	Computer Support Specialist
Susan Pierce	Asst. to Assoc. V.P. for Computing (1/2 time)
Paul Gandel	Sr. Dir. of Academic Computing
Brenda Yu	Data Entry Operator
Ira Uniyal	Operations
Anil D'Souza	Lab Monitor
Genevieve Mukherjee	Lab Monitor
Sean McMains	Lab Monitor
Kang Ning Ming	Lab Monitor
Ching Lee	Output Consultant
Hong Wan Tham	Output Consultant
Cynthia Swatloski	Output Consultant
Gratian Perez	Output Consultant
Shang Foo	Output Consultant
Emmanuel Wilson	Job Distribution

Employees who have resigned since June 1, 1992:

NAME	POSITION
Kyle Capps	Computer Systems Manager
Norma Hernandez	Data Entry Operator
Patricia Parham	Data Entry Operator
Kanaya Chevli	Operations
Blaine Morgan	Operations
Brad Kelly	Job Distribution ■



Information Resources Council News

Minutes provided by Sue Harrison, Recording Secretary

IRC Regular Voting Members: Ray Vondran, Library and Information Sciences (Chair); Dave Barker, TCOM Information Resources Council; Cengiz Capan, College of Business; Carolyn Cunningham, Student Affairs; Chuck Fuller, Fiscal Affairs; Don Grose, Libraries; David Hartman, School of Community Services; Monica Holmes, Graduate Student Council; Royce Lumpkin, College of Music; Steve Miller, Administrative Affairs; Don Palermo, Academic Administration; Jean Schaae, College of Arts and Sciences; Beth Schlager, School of Merchandising and Hospitality Management; Paul Schlieve, College of Education; Neal Tate, Faculty Senate. **IRC Ex-officio Non-voting Members:** Bill Buntain, Computing Center; Jim Curry, Microcomputer Maintenance Shop; Paul Gandel, Computing Center; Richard Harris, Computing Center; Coy Hoggard, Computing Center; Tom Newell, Telecommunications.

Tuesday, September 15, 1992

New IRC members are as follows: David Hartman will represent the School of Community Services, Royce Lumpkin will represent the College of Music, and Beth Schlager will represent the School of Merchandising & Hospitality Management.

Richard Harris reported that at the last IRC Steering Committee meeting, the Vice Presidents approved the use of the Chilton Hall General Access Lab as a training facility but cautioned that funding be handled correctly, and that use of the lab as a training facility not infringe on the lab's use for general access purposes.

The IRC Steering Committee was briefed on Video Teleconferencing possibilities. The committee also gave its blessing to going ahead with Phase IV of the fiber optic backbone project.

Paul Schlieve reported that he will be attending a meeting at the Texas Education Agency regarding state-wide standards for video conferencing and that The College of Education is about to start up compressed video conferencing between UNT and a couple of Dallas public schools by which they will deliver UNT courses.

Cengiz Capan reported that the GALC had met on September 1, at which time Lab Managers brought the committee up to date on what they had done in their labs over the summer. It was reported that all labs are operational, that Arts & Sciences is working on setting up a lab in Terrill Hall, and the Library lab is operating 24 hours/day. There was some discussion at the meeting about monitoring the use of laser printers in the labs. In addition, lab managers have been asked to review the current GAL policies and procedures to see if they need updating. The Committee discussed the need for starting on the planning and budgeting cycle, getting each lab's utilization reports from lab monitors, and obtaining input through college committees to see what they need for their labs.

In response to a question from Dr. Vondran, Capan responded that faculty could use the General Access Labs if the use was instructional and for the purpose of enhancing their teaching of a course. They would only be restricted from producing departmental memos, personal research, etc. Departments are to be discouraged from having

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faculty use General Access Labs instead of buying them a computer and a printer for their office. Don Grose commented that the Library is looking for some funds and space in which to set up a faculty lab.

Bill Buntain distributed a report to bring the Council up-to-date on the status of the fiber optic backbone and the building wiring projects. Buntain suggested that if people have users in their departments who still have COAX cards for accessing the mainframe, that they seriously consider moving to the SNA gateway. In response to a question from Susan Pierce regarding ethernet availability over the broadband, Buntain said they expect to receive the equipment any day and would be making that available as soon as possible.

Since Susan Pierce is no longer Chair of the De Facto Standards Committee, and Philip Baczewski is no longer Acting Director of Academic Computing, Dr. Vondran announced that Paul Gandel would be replacing Philip and suggested that he serve as Chair of the Committee, to which he agreed. David Hartman was named to replace Susan Pierce and the rest of the committee will remain the same: Neal Tate, Don Grose, Carolyn Cunningham, Jim Curry, and Bill Buntain.

Paul Schlieve reported that the E-mail task force has not recently met as a group but have been investigating various products. It has been determined that WordPerfect Office, as it stands, is not an acceptable product; however, WordPerfect Corp. is in the process of rewriting it and it appears that they may be correcting some of the elements that performed poorly for UNT's applications. The task force is looking forward to evaluating their revised product when it becomes available.

The E-mail task force continues to look at alternative forms of communication, for example, Trumpet Software, which is a bulletin board product, and Gopher software, which is a newsreader service. Schlieve also reported that WordPerfect is moving into the area of forms so it is being looked at for possible use

in electronic forms transmission. Schlieve welcomes input from all users via electronic mail in regard to all issues concerning electronic mail. Some discussion followed regarding the appropriate use of electronic mail.

Dr. Vondran distributed the final report of the Instructional Technology Task Force and pointed out that one of their recommendations is that the University establish a standing committee on instructional technology as a subcommittee of the Information Resources Council. The committee would have responsibility for:

- ① alerting the University to new technological developments;
- ② keeping abreast of uses of technology in instruction on this campus and throughout the higher education community;

- ③ working with the appropriate academic and administrative units to make available to the faculty training in the applications of the new technologies;
- ④ performing other duties within its purview as determined by the IRC.

Vondran asked that members be thinking about the IRC's reorganization of its subcommittees with this recommendation in mind.

Vondran suggested the reorganization of the IRC's subcommittee structure into two large subcommittees, one for administrative computing and one for academic computing, each of which would contain end users and providers who are not members of the IRC. ■



Academic Computing Services is offering the following short courses for the remainder of the 1992 fall semester. Please preregister to attend. A registration form can be found at the end of this issue. **A maximum of 10 people will be admitted to each of the courses held in ISB 110. A maximum of 15 people will be admitted to each of the courses held in Chilton 255. A maximum of 8 people will be admitted to each of the courses held in ISB 123.** *Academic Computing Services reserves the right to cancel ANY course that has 5 people or fewer registered 3 days before the date of the course.*

PLEASE NOTE: Faculty and students have first priority to register for these classes. All people registering for hands-on (ISB 110) HDS, VAX and/or UNIX

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courses should have current User-IDs. Applications for User-IDs are available in the Computing Center main office (ISB 119).

HDS, VAX, AND UNIX COURSES

1. **Introduction to CMS for MUSIC Users** — This course will focus on helping people who use MUSIC/SP (which is being phased out) migrate to the CMS operating system. These courses will be taught on demand. Contact Academic Computing Services (565-2324) to request a class.
2. **Introduction to UNIX** — Take the plunge into the wonderful world of UNIX. This course will start with a short discussion of the history and evolution of UNIX, covering both the "Berkley Software Distribution" and "AT&T System V" variants of UNIX. Topics covered will be the basic necessities for using UNIX and use of some of the various utilities available in UNIX.
A two-hour session, held in the Chilton General Access Lab (Chilton 255):
 - **Tuesday, October 6: 3-5 p.m. Instructor: Marc St.-Gil**
3. **Introduction to vi** — This course is recommended for individuals who want to learn the standard UNIX editor, vi.
A two-hour session, held in the Chilton General Access Lab (Chilton 255):
 - **Thursday, October 8: 3-5 p.m. Instructor: Marc St.-Gil**

STATISTICAL PACKAGE COURSES

1. **Introduction to SAS** — This course is recommended for individuals who plan to incorporate statistical analyses into their research. The basic concepts of the SAS system are covered in this course. **This course or prior knowledge of SAS is a pre-requisite for all other SAS courses.**
A two-hour session, held in the Science Library (ACS General Access Lab, ISB 110):
 - **Tuesday, October 20: 3-5 p.m. Instructor: Phanit Laosirirat**
2. **Introduction to SAS on CMS** — This course is recommended for individuals who plan to use SAS on the academic HDS IBM-compatible mainframe. Topics covered include creating SAS programs, reading data into SAS programs, saving SAS datasets on a minidisk, importing/exporting SAS datasets to and from other SAS systems, and preparing and submitting SAS jobs to OS/MVS. SAS is used interactively in this course. **Prior knowledge of the SAS command language or attendance in the Intro. to SAS course is required.**
A one-hour session will be held in the Science Library (ACS General Access Lab, ISB 110):
 - **Wednesday, October 21: 4-5 p.m. Instructor: Panu Sittiwong**
3. **Introduction to SAS on UNIX** — This course is recommended for individuals who plan to use SAS on the Solbourne minicomputer. Topics covered include creating SAS programs, reading data into SAS programs, saving SAS datasets on a minidisk, importing/exporting SAS datasets to and from other SAS systems, and preparing and submitting SAS jobs to OS/MVS. This class will utilize the SAS menus under the X Window System. **Prior knowledge of the SAS command language or attendance in the Intro. to SAS course is required.**
A one-hour session will be held in the Science Library (ACS General Access Lab, ISB 110):
 - **Monday, October 19: 4-5 p.m. Instructor: Panu Sittiwong**
4. **Introduction to SAS PC** — This course covers the basics of using SAS PC, Version 6.04, for IBM and compatible PCs. Topics covered include using the SAS Display Manager, loading files, selecting variables and running statistical analyses. Emphasis will be placed on running SAS in interactive mode. **Prior knowledge of the SAS command language or attendance in the Intro. to SAS course is required.**
A one-hour session, held in the Science Library (ACS General Access Lab, ISB 110):
 - **Thursday, October 22: 4-5 p.m. Instructor: Phanit Laosirirat**

5. **Introduction to SPSS** — This course is recommended for individuals who plan to incorporate statistical analyses into their research and want to use SPSS on the academic HDS IBM-compatible mainframe. It emphasizes using SPSS from the CMS operating system. Topics covered include creating SPSS programs, reading data into SPSS programs, saving SAS datasets on a minidisk, importing/exporting SPSS datasets to and from other SPSS systems, and preparing and submitting SPSS jobs to OS/MVS. SPSS is used interactively in this course.
A three-hour session to be held in the Science Library (ACS General Access Lab, ISB 110):
 - **Monday, October 26: 2-5 p.m. Instructor: James Yarbrough**

6. **Introduction to SPSS PC +** — This course covers the basics of using SPSS PC +, Version 4.0.1, for IBM and compatible PCs. Topics covered include using the menu and help interfaces in REVIEW, loading files, selecting variables, and running statistical analyses. Emphasis will be placed on building files for execution interactively. **Prior knowledge of the SPSS command language or attendance in the Intro. to SPSS course is required.**
A three-hour session, held in the Science Library (ACS General Access Lab, ISB 110):
 - **Tuesday, October 27: 2-5 p.m. Instructor: Phanit Laosirirat**

7. **Introduction to SAS/Graph** — This course is recommended for individuals who plan to incorporate statistical analyses into their research and want to display their results graphically. **Prior knowledge of the SAS command language or attendance in the Intro. to SAS course is required.**
A two-hour session, held in the Science Library (ACS General Access Lab, ISB 110):
 - **Wednesday, October 14: 3-5 p.m. Instructor: Panu Sittiwong**

WIDE AREA NETWORK COURSES

1. **Introduction to Electronic Mail and Discussion Groups on CMS** — This course will cover the basics of using CMS MAIL to send and receive elec-

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tronic mail to both Internet and BITNET. The use of electronic mailing lists including BITNET LISTSERV will also be discussed. **Prior knowledge of CMS is required.**

A two-hour session, held in the Academic Computing Conference Room (ISB 123):

- **Monday, October 5: 3-5 p.m. Instructor: Philip Baczewski**

2. **Introduction to Electronic Mail and Discussion Groups on VAX/VMS** - This course will cover the basics of using VAX MAIL to send and receive electronic mail to both the Internet and BITNET. The use of electronic mailing lists including BITNET LISTSERV will be discussed. Using USENET newsgroups via the ANU News program on the VAX will also be explored. **Prior knowledge of VAX/VMS is required.**

A two-hour session, held in the Academic Computing Conference Room (ISB 123):

- **Tuesday, October 13: 3-5 p.m. Instructor: Billy Barron**

3. **Introduction to Internet Tools and Techniques** - The Internet is a collection of related computer networks that link almost a million computers throughout the world. This course will cover file transfer, remote login, use of online library catalogs at other universities,archie, HYTELNET, Gopher, and many other Internet topics **except** electronic mail. **Prior knowledge of at least one of the following interactive operating systems is required: VAX/VMS, CMS, UNIX, MS-DOS, MAC.**

A one and one-half-hour session, held in the Computing Center Conference Room (ISB 123):

- **Thursday, October 15: 3:30-5 p.m. Instructor: Billy Barron**

MICROCOMPUTER COURSES

1. **Introduction to Macintosh for Students** - This course is recommended for students who want to learn about Apple Macintosh computers.

A two-hour session, held in the Science Library (ACS General Access Lab, ISB 110):

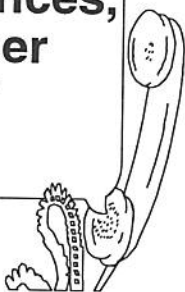
- **Thursday, October 1: 2-4 p.m. Instructor: Eriq Neale**

2. **Introduction to WordPerfect 5.1 for Students** - Students who wish to use a word processing system to produce class papers and projects are encouraged to take this course. **Prior knowledge of basic DOS commands required. Bring one 5 1/4" low density formatted diskette. There is no difference between WP 5.1 and 5.0 at the introductory level. If you are comfortable with 5.0 do not take this class.**

A three-hour session, held in the Science Library (ACS General Access Lab, ISB 110):

- **Thursday, October 8: 2-5 p.m. Instructor: Sandy Franklin ■**

**Calls For
Papers,
Conferences,
And Other
Items of
Interest**



We have received the following "calls" and announcements from various organizations.

Call for Papers, Proposals

- **ACM Multimedia '93, Anaheim, CA, August 1-5, 1993 (colocated with SIGGRAPH '93)** — This first ACM international conference on multimedia will provide a forum for papers, panels, courses, workshops, and exhibits focusing on the synergies between processing and communicating information represented in

multimedia. Research ideas, emerging technologies, engineering methodologies, prototype demonstrations, and experiences should be submitted for review. All submissions are due by **January 8, 1993**. An author's kit containing submission guidelines is available via anonymous ftp at siggraph.org (128.248.245.250), or by sending E-mail to contrib.multimedia93@siggraph.org.

- **Total Quality Management: A Global Challenge, International Academy of Business Disciplines, New Orleans, LA, April 8-11, 1993** — Proposals for paper presentations, symposia, tutorials, and workshops are being accepted through **November 27, 1992**. Contact Connie Walt (sfcw@nmmus.bitnet).

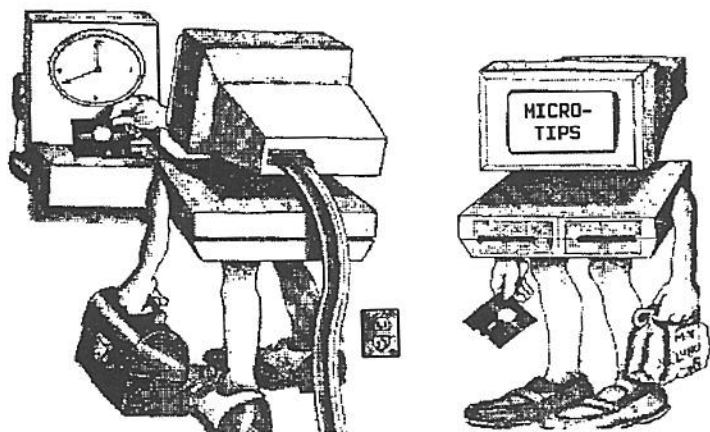
Graduate, Post-graduate Opportunities

- **1993 Summer Institute in Japan** — The National Science Foundation and the National Institutes of Health are sponsoring a summer institute in Japan for U.S. graduate students in science and engineering. Deadline for application is **December 1, 1992**. To receive a copy of application materials, send a message to stisserv@nsf.gov or stisserv@nsf.bitnet with the body of the message reading:

Request: stis
Topic: nsf92105
Request: end

You can also contact NSF's Japan Program staff at NSFJinfo@nsf.gov or NSFJinfo@nsf.bitnet.

- **Learning and Instructional Psychologist** — A one-year term post-doctoral research fellowship (with extension possibility) is being offered through the National Research Council Research Awards and the U.S. Army Research Institute in Alexandria, Virginia. The main responsibility of this position is to derive prescriptive implications for the development of training systems from the review of various learning theories and research findings that are basically descriptive in nature. Send a vita, including phone numbers of references, to Dr. Robert J. Seidel, U.S. Army Research Institute, 5001 Eisenhower Ave., Alexandria, VA 22333-5600. Samples of research reports would also be appreciated. ■



How do you decide on what to try?

There is a PC-SIG *Encyclopedia of Shareware* which lists and describes each disk in the PC-SIG library. Each entry will tell you such things as the program's system requirements, registration fees, and features of the program. There is a copy you may look through in the ACS General Access Lab in ISB 110 or you may find it in any large bookstore (the University Store carries it).

How to access the PC-SIG library at UNT

The PC-SIG library is accessible through different file servers on campus. If you are on the ACS, SCS lab, PON, or CC1 file server, you can access PC-SIG. More file servers will be adding access to PC-SIG shortly, so if PC-SIG is not an option on your server menu, ask your file server manager to add it! If your file server doesn't have access to PC-SIG (or if you aren't a file server user, or if you haven't a clue what a file server is), **you still have access to PC-SIG** in the ACS General Access Lab in ISB 110.

With that in mind, let's find some software to try...

(Don't forget to bring a formatted floppy disk or two, so you can take your shareware home.)

Here we are in ISB 110, sitting in front of the ACS menu (if you have any questions about this, ask the lab consultant). First, choose option **I - Other Software and Utilities** from the main menu. Next, choose **F - PC-SIG Catalog** from the "Other Software and Utility" screen. (If you are in your office on campus, go to your DOS prompt and type **PCSIG**). When you have attached to the PC-SIG catalog, you will get an initial "Welcome" screen telling you about PC-SIG. At the bottom is a message to strike a key when ready. The **O:** prompt will appear. Type **go** to start PC-SIG, **exit** to quit.

*This column is intended to serve as a forum for sharing useful tips on making more productive use of microcomputers. If you have a tip that you feel may be of use to campus users, submit it to the **Benchmarks** Editor for possible inclusion in a future issue.*

The PC-SIG Library

By Cathy Hardy, Academic Database Consultant (ac55@unt.edu)

*This Micro-Tip is "back by popular demand." It first appeared in the January 1992 issue of **Benchmarks** (Vol. 13, No. 1, p. 19). It has been edited and updated for this issue.*

How do you buy software? Do you read the package and hope the program will fit your needs? Do you take a friend's recommendation? Do you buy a program that's on the current "top 10" list in some PC magazine? Or do you "try it on" in the store like a pair of shoes? Well, for the most part, software costs more than shoes! You walk in, and in most cases, buy it, then you find out that it's not what you thought it would be when you get it home. Unlike shoes, however, you usually can't take it back! Wouldn't it be better to try before you buy? And buy it directly from the author, rather than paying for the software, packaging, and the store's markup?

Well, welcome to the PC-SIG library of shareware. Bring your own disk, browse through over 2400 titles, pick a program or programs to try, take 'em home and give 'em a test spin. If you don't like it, try another, or write the author and let him/her know what you'd like changed.

What is shareware?

Shareware allows you to purchase software directly from the author. The authors feel that they have a program that they really want to share with people; they want people to try it, use it and enjoy it. Although most of the software in the PC-SIG library is shareware (a registration fee is required if you decide to keep it and use it), there are some public domain (free) programs. Each program will come with some documentation which will include a registration form and information about the program.

Main Menu

When you type **go** and press Enter, the PC-SIG Main Menu appears. This menu offers four options:

- A) View information on PC-SIG and this CD ROM
- B) Use WordCruncher to find program information
- C) View disk titles by program category
- D) Go to or copy a specific disk

You may choose A, C, or D (WordCruncher is not available on file servers).

If this is your first time to use PC-SIG, take the time to choose A to get information on PC-SIG, shareware, public domain software, and registration. When you have finished, press **<ESC>** to return to the Main Menu.

Copying a disk

Assuming you don't have the PKUNZIP program at home, let's copy it onto a floppy "ready to use." You'll need this program to expand the files you bring home from PC-SIG.¹

At the Main Menu, press **<D>** to copy a specific disk. This menu has three options:

- A) Exit the Copy-Access Program
- B) Go to a Disk on the CD-ROM
- C) Copy a disk from the CD-ROM for use

Usually you will choose B. If you choose C, the PC-SIG program will automatically "unzip" the file.

This time, choose C. When asked for a disk number, type in **1364**.

Then you will be asked to enter a destination drive or directory. Put one of your formatted floppies in drive A: and type A:. PC-SIG will explode and ex-

¹ To save space, the files on the CD-ROM are compressed. If you choose to copy a disk for use (selection C), PC-SIG is kind enough to expand and reconstruct the file. (This is fine for directly copying programs to your own PC's hard drive with plenty of room, but unfortunately, some won't fit on a single floppy. So, usually if you plan to "take it home," take it home "zipped.")

pand each file on the 1364 disk. When it is finished, you will see the following message:

Press any key to continue copy access program

When you press a key, PC-SIG moves back to the previous menu (where you indicated the disk number and drive) and writes the expanded files to your floppy in drive A:. When finished, you will see a message which says:

Copy completed, press any key to continue...

Pressing a key here will back you out one more menu to the Copy Access menu where you can exit the copy access program, or copy another disk. Now let's find a program to copy...

Press **<A>** to exit the Copy-Access Program. Now you are back to the Main Menu. Choose C to look through the program categories available. Let's see...what looks interesting? How about something in Home and Personal? Press **<H>**.

Something in Auto/Vehicle Management? Food and Drink Preparation? Health Management? Home Management? Movie/VCR/Music Databases? Let's look under Home Management. How about Home Applications (disk 321)? (Looking in the *Encyclopedia* I see that Home Applications includes a wide range of programs including one for guitar tuning, analysis of IRAs, picking against the NFL point spreads, a home inventory program, and more. Most disks contain the files for a single program, so we've hit an unusual one.) Press **<ESC>** to return to the Main Menu.

Copying a disk

At the Main Menu, press **<D>** again to copy a specific disk. Remember the three options?

- A) Exit the Copy-Access Program
- B) Go to a Disk on the CD-ROM
- C) Copy a disk from the CD-ROM for use

Now we want to choose B. We want to go directly to disk 321, copy the zipped file onto a floppy, take it home and unzip it.

You will be asked for a disk number. Type **321** and press **<ENTER>**. Shortly, you will see this screen:

```
.....
You are now in the disk subdirec-
tory O:\301_400\DISK0364 for disk
number 0321.
```

```
Standard DOS commands will access
program files in this subdirec-
tory. If you wish to return to the
Menu System type "CD\" and press
Enter. This takes you to the root
directory where typing "GO" and
pressing Enter will start the Menu
System.
```

```
.....
Type 'go' to start PC-SIG, 'exit'
to quit.
O:\301_400\DISK0321
```

Now, put a floppy in drive A: and type: **COPY *.* A:**

This will copy the zip file in O:\301_400\DISK0321 to your floppy.

When the file has copied to your disk, you have two options:

- ❶ If you want to copy another, type **GO** to get to the PC-SIG menu.
- ❷ If you are finished, type **exit**. This will log you out of the PC-SIG library.

IMPORTANT! Be sure to log out when you are finished! If you don't, you will still be attached to PC-SIG. Only 30 people can be attached at a time. If you don't log out, you tie up one of the connections. If 29 other people don't log out, no one can use PC-SIG!

Now you can take your floppies home, unzip the files, and test the software. If you have questions (or comments) regarding PC-SIG at UNT, call Academic Computing Services at 565-2324. ■



Virus Update

Compiled by Claudia Lynch, *Benchmarks*
Editor (BITNET: AS04@UNTVMI1)

The following information comes from
The Computer Incident Advisory Ca-
pability Information Bulletin and the
VIRUS-L Digest.

IBM and Compatible PCs

- **New Version of F-PROT** — F-PROT 2.05 has been released and is now available in "the usual locations."

UNT has a site license for F-PROT. To acquire the latest release, you can:

- Anonymous FTP to ftp.unt.edu. GET the file **fp205.exe** in the pub/antivirus/ibm directory.
- Request the software from Network and Microcomputer Support at 565-2316 if you are faculty or staff.
- Go to the ACS General Access Lab in ISB 110 and copy F-PROT onto your own diskettes.

F-PROT 2.05 detects and removes 109 new viruses!

- **Hacked versions of PKZIP** — In the July/August issue of *Benchmarks* (Vol. 13, No. 6, p. 26) we reported the existence of a hacked version of PKZIP 1.93 that was cir-

culating called PKZ201.ZIP or PKZ201.EXE. It turns out that there is now also another bogus version, 2.2, seen around the country as PKZIPV2.ZIP and PKZIPV2.EXE.

The current released version of PKZIP is 1.10. A new version is expected to be released in a few months. It was planned to be christened as version 2.00, but will now be given a version number greater than 2.2. PKWARE Inc has stated that they will never issue a version 2.01 or 2.2.

A good copy of the latest version of PKZIP can always be gotten from the PKWARE BBS at 414-354-8670. You can contact PKWARE Inc. at 9025 N. Deerwood Dr., Brown Deer, WI 53223. Phone 414-354-8699. They would like to be notified if you find one of the bogus versions of PKZIP.

- **Castle Wolfenstein Hacked** — A hacked version of the game *Castle Wolfenstein* has appeared on a BBS in Florida. The virus is in a file called **wolfchet.exe**.

Macintosh

- **Three former Cornell students plead guilty in connection with the creation of the MAC MBDF virus** — David Blumenthal and Mark Pilgrim plead guilty to one count each of second degree computer tampering, a misdemeanor. Randall Swanson plead guilty to a reduced charge

of disorderly conduct. It is believed that the students have either been expelled or suspended from attending classes at Cornell for at least one year. ■

Wanted: Classroom Computer Demonstrations

Announced on *CHEMED-L@uwf.bitnet*

The Division of Chemical Education's Committee on Computers in Chemical Education is soliciting computer demonstrations to be presented at the National ACS meeting in Denver, CO., Wednesday evening, March 31, 1993. This session will publicize the uses and capabilities of commercial and locally developed software and hardware. These interactive "poster-like" sessions will consist of a "show and tell" type environment on PC or Macintosh platforms. Other platforms or PC/Mac platforms requiring specialized hardware are invited with the presenter providing the required hardware.

Anyone interested in participating in the session should send their name, address and phone number together with a tentative title and platform type to one of the addresses listed below before **November 1, 1992:**

DOS

M. Lynn James
Dept. of Chemistry and Biochemistry
University of Northern Colorado
Greeley, CO 80639
(303) 351-1285

MAC

Henry R. Derr
Dept. of Chemistry
Laramie County Community College
1400 E. College Dr.
Cheyenne, WY 82007-3299
(307) 778-1129
HDERR@CORRAL.UWYO.EDU ■

WordPerfect User's Group

The WordPerfect User's Group continues to meet in the SCS Lab, Chilton Hall 255 from 2-3 p.m. Following is the fall schedule:

- **October 16** — Equation Editor
- **November 20** — Demo of new graphics package, Presentation 2.0 by WP representative, Colby Ward.
- **December 18** — Tables. ■

VAXCLUSTER USAGE STATISTICS

August Top Ten Programs: CPU Time Used

Program	Description	CPU Time	Percent of Total
1. GAUSSIAN	Molecular Modelling	2 22:50:12.53	25.4
2. User programs	Compiled Programs	2 11:02:05.58	21.2
3. DEFRAG	Disk Optimizer	1 23:49:56.58	17.1
4. NEWS	ANU News Utility	1 09:48:50.39	12.1
5. BACKUP	Disk Backups	0 08:27:19.24	3.0
6. MAIL_SERVER	VMS Mail Server	0 08:07:28.28	2.9
7. MAIL	VMS Mail Utility	0 06:26:28.04	2.3
8. LOGINOUT	User Login	0 05:47:00.28	2.1
9. VAXC	C Compiler	0 04:20:28.96	1.6
10. XZZY	Chat Utility	0 03:44:15.65	1.3
Total		11 15:00:35.57	

SOLBOURNE USAGE STATISTICS

August Top Ten Programs: CPU Time Used

Program	Description	CPU Minutes	Percent of Total
1. UserPgm	User Programs	91504.9	54.3
2. g90	Gaussian 90	49363.5	29.3
3. sas	Statistical Package	21491.7	12.7
4. find	File Locator Utility	1217.3	0.7
5. update	Filesystem sync	581.6	0.3
6. gopher	Gopher Information Service	425.1	0.3
7. less	File Lister	270.4	0.2
8. nn	USENET Newsreader	207.3	0.1
9. newirc	Internet Relay Chat Client	181.8	0.1
10. tesh	Command Line Interpreter	171.5	0.1
Total		168413.6	

Dow Jones News/Retrieval Available Through the Internet

Taken from a Dow Jones Press Release, Princeton, NJ, September 1, 1992

Dow Jones News/Retrieval is now available to academic and commercial institutions through the Internet, a global data communications network consisting of more than 6,000 individual networks spread over 40 countries.

Access to News/Retrieval's world business news, industry information and global market analyses was previously available only through a dial-up connection. Now academic institutions on the Internet may access News/Retrieval directly. Commercial organizations may now access News/Retrieval through a connection to Global Enterprise Service's JvNCnet.

"We are offering News/Retrieval through the Internet to address the specific needs of the academic community as well as corporations that find the network useful to their businesses," said Allen Grossman, executive director of product marketing and development for Dow Jones Information Services. "Having News/Retrieval on the Internet allows our academic customers to reach a variety of services from the same connection at a lower cost and at a much faster speed," he noted.

Dow Jones News/Retrieval is a leading provider of on-line business and financial news, company profiles and full-text articles from more than 1,300 publications, and is the exclusive on-line provider of the full text of the *Wall Street Journal* and its international editions, *Barron's*, and the Dow Jones family of domestic and international newswires.

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MAINFRAME TECHNICAL SERVICES

Mainframe Performance Statistics

August Top Ten Programs : Frequency Of Runs

Program	Description	# of Runs	% of Total
1. IDCAMS	VSAM	4568	18.9
2. PGM=*.DD	Compiled Program	3926	16.3
3. IEWL	Linkage Editor	3572	14.8
4. IEBGENER	IBM Utility	2948	12.2
5. IGYCRCTL	VS COBOL2 Compiler	2645	11.0
6. SPCHLCOB	COBOL2 Report Writer	1629	6.8
7. IKJEFT01	Password Change	932	3.9
8. SASLPA	SAS Version 5.18	860	3.9
9. SPSS	SPSS Version 4.0	649	2.7
10. IEFBR14	IBM Null Utility	354	1.5

Key Causes Of Lost Productivity In August: ACAD CPU

There was no lost productivity for the Month of August.

Key Causes Of Lost Productivity In August: ADMN CPU

Miscellaneous

1. Systems software development. 2.18 HOURS ■

August Top Ten Programs: CPU Seconds Used

Program	Description	CPU Seconds	% of Total
1. SASLPA	SAS Version 5.18	227232	72.7
2. PGM=*.DD	Compiled Program	27977	8.9
3. SAS370	SAS Version 6.06	16505	5.3
4. SPSS	SPSS Version 4.0	15008	4.8
5. COMPLET4	Academic COM-LETE	9031	2.9
6. SPCHLCOB	COBOL2 Report Writer	5750	1.8
7. IGYCRCTL	VS COBOL2 Compiler	3483	1.1
8. IDCAMS	VSAM Utility	1768	0.6
9. IEWL	Linkage Editor	1399	0.4
10. IEBGENER	IBM Utility	886	0.3

System Uptime

- The ACAD CPU (HDS/8083) achieved 100% uptime in August. The HDS/7360 DASD achieved 100% uptime in August. The HDS/7380 DASD achieved 100% uptime in August.
- The ADM CPU (IBM 9121/440 processor) achieved 100% uptime in August. The HDS/7360 DASD achieved 100% uptime in August. The HDS/7380 DASD achieved 100% uptime in August. The IBM 3390 DASD achieved 100% uptime in August. The EMC Solid State Disk achieved 100% uptime in August. ■

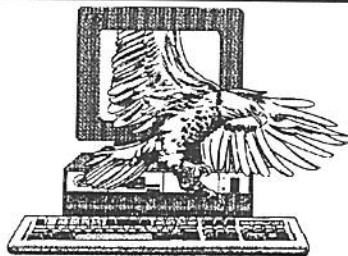
Operating Systems Performance Statistics for August

CPU	SYSTEM	Planned Production Hours	Production Hours Achieved	System Uptime
ACAD	VM/XA	744.00	744.0	100.0%
ACAD	MUSIC/SP	725.73	725.73	100.0%
ACAD	MVS/JES2	744.00	744.00	100.0%
ACAD	COMPLETA	744.00	743.19	100.0%
ADMN	MVS/JES2	744.00	742.29	99.8%
ADMN	COMPLETA	329.00	329.00	100.0%
ADMN	ADABASA	744.00	717.22	99.7%

MAINFRAME TECHNICAL SERVICES

Disk Backup Schedules

SYSTEM	BACKUP	DESCRIPTION
Administrative MVS/SP	Daily	Monday - Friday around 7 p.m. (after COM-LETE is shut down) & on Saturday & Sunday if COM-LETE has been up that day.
	Weekly	Full pack dumps taken each Sunday morning.
	Monthly	Full pack dumps taken on the first day of each month.
Academic MVS/SP	Daily	Monday - Sunday during the early hours of the morning.
	Weekly	Full pack dumps taken each Sunday.
	Monthly	Full volume dumps taken on the first day of each month.
MUSIC/SP	Daily	Wednesday - Monday starting at 4 a.m. and lasting about 30 minutes.
	Weekly	Tuesday mornings at 3 a.m., these last about 2 hours.
	Semester	Once a semester, a permanent backup is taken.
VM/XA	VM Weekly	Early every Wednesday morning.
	CMS mini-disks	Daily backup performed early every morning. Weekly backup every Tuesday starting after Midnight.
	Semester	Once a semester, a permanent backup is taken.
VAXcluster	Daily	Incremental backups are performed Monday - Thursday at 6 p.m. Saturday & Sunday at 5 p.m.
	Weekly	Full backups are performed every Friday beginning at 8 a.m. Generally lasts all day.
	Monthly	A "stand-alone" backup is performed monthly. Dates and times are given in the system log-on message.
	Semester	Once a semester, a permanent backup is taken.
Solbourne	Daily	Incremental backups are performed Sunday - Friday at 2 a.m.
	Weekly	Full backups are performed every Saturday at 7 a.m.
	Semester	Once a semester, a permanent backup is taken.



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- **Intro. to SAS (ISB 110)*:**
____ Monday, Sept. 14: 2-4 p.m.
____ Tuesday, Oct. 20: 3-5 p.m.
- **Intro. to SAS on CMS (ISB 110)*:**
____ Monday, Sept. 21: 3-4 p.m.
____ Wednesday, Oct. 21: 4-5 p.m.
- **Intro. to IBM JCL (ISB 123):**
____ Wednesday, Sept. 23: 3-5 p.m.
- **Intro. to SPSS (ISB 110)*:**
____ Thursday, Sept. 24: 1-4 p.m.
____ Monday, Oct. 26: 2-5 p.m.
- **Intro. to Electronic Mail & Discussion Groups on CMS (ISB 123):**
____ Monday, Oct. 5: 3-5 p.m.
- **Intro. to Internet Tools (ISB 123):**
____ Thursday, Oct. 15: 3:30-5 p.m.
- **Intro. to UNIX (Chilton 255)*:**
____ Tuesday, Oct. 6: 3-5 p.m.
- **Intro. to SAS on UNIX (ISB 110)*:**
____ Monday, Oct. 19: 4-5 p.m.
- **Intro. to Macintosh (ISB 110):**
____ Thursday, Oct. 1: 2-4 p.m.
- **Intro. to DOS (ISB 110):**
____ Tuesday, Sept. 22: 2-4 p.m.
- **Intro. to CMS (ISB 110)*:**
____ Thursday, Sept. 17: 3-5 p.m.
____ Wednesday, Sept. 30: 10 a.m.-Noon
- **Intro. to SAS PC (ISB 110):**
____ Wednesday, Sept. 16: 4-5 p.m.
____ Thursday, Oct. 22: 4-5 p.m.
- **Intro. to VAX/VMS (Chilton 255)*:**
____ Wednesday, Sept. 30: 3-5 p.m.
- **Intro. to SPSS PC+ (ISB 110):**
____ Tuesday, Sept. 29: 2-5 p.m.
____ Tuesday, Oct. 27: 2-5 p.m.
- **Intro. to Electronic Mail & Discussion Groups on VMS (ISB 123):**
____ Tuesday, Oct. 13: 3-5 p.m.
- **Intro. to Procomm+ (Chilton 255):**
____ Tuesday, Sept. 15: 3-4 pm
- **Intro. to vi (Chilton 255)*:**
____ Thursday, Oct. 8: 3-5 p.m.
- **Intro. to SAS/Graph (ISB 110):**
____ Wednesday, Oct. 14: 3-4 p.m.
- **Intro. to WP 5.1 (ISB 110):**
____ Thursday, Oct. 8: 2-5 p.m.



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